Mathematics workshop

hundreds	tens	ones		tenths	hundredths
			.		
			.		
			.		

100 Square

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

In what number parking spot is the red car parked?
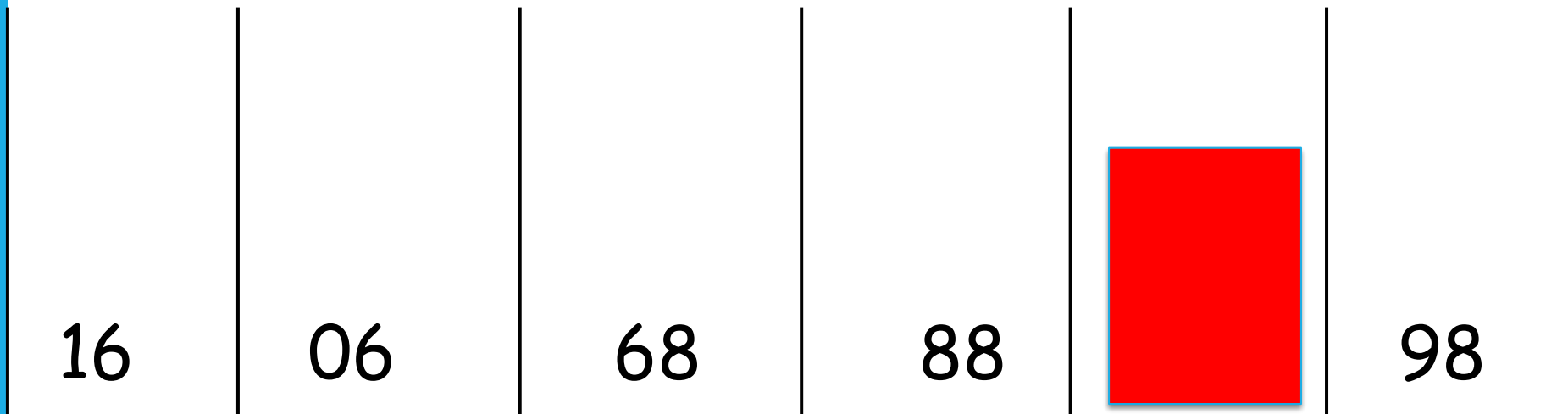
| 16 | 06 | 68 | 88 | | 98 |

In what number parking spot is the red car parked?

ANSWER: 87

(The number line is upside-down)

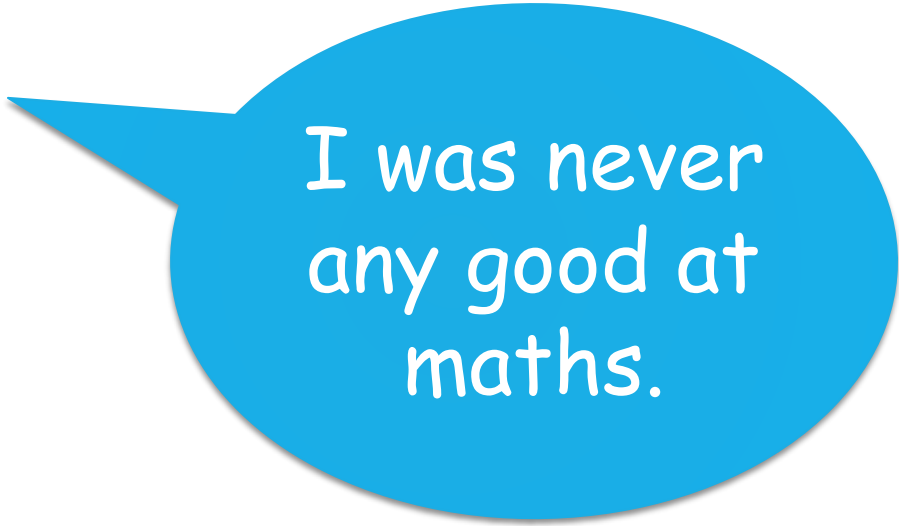| 16 | 06 | 68 | 88 | | 98 |
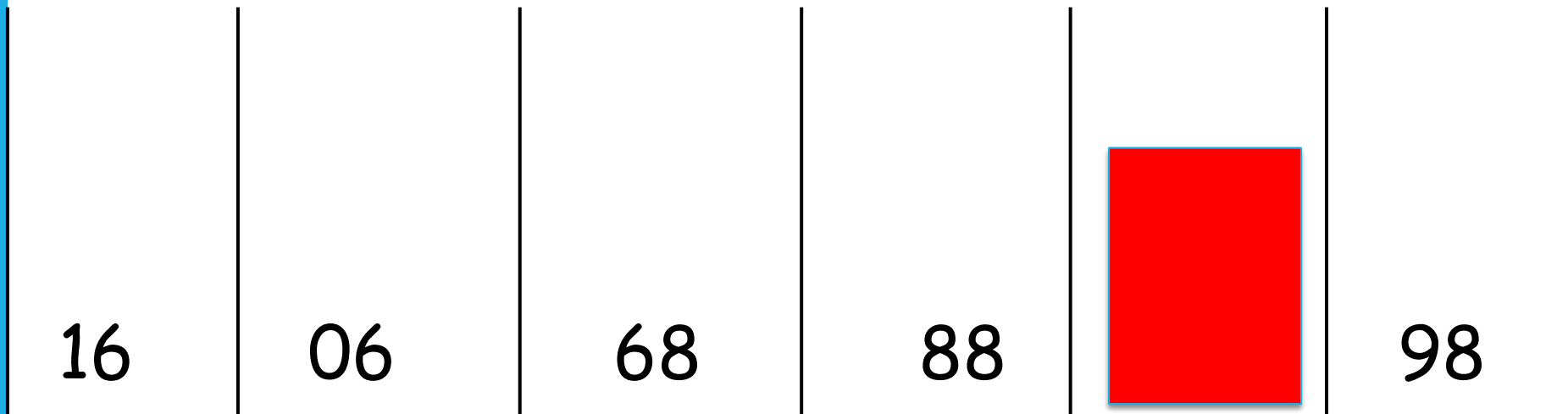
Aims for the workshop today

- What does maths look like in Year 4?

- How is maths taught at Cecil Road Primary School?

- How can children be supported at home?

ON A SCALE OF ONE TO TEN, HOW MUCH DO YOU HONESTLY ENJOY MATHEMATICS?

Research suggests that as many as 60% of adults would rather clean the toilet than work out a maths problem.

An even larger percentage say:

I was never any good at maths.

Research also suggests that adults would not openly admit to being poor at reading.

- It may come as a surprise that almost half of the working-age population (17 million) of England have numeracy skills equivalent to those expected for an 11 year-old child.

- Adults with poor numeracy skills are twice as likely to be unemployed than those who enjoy some competency in numeracy.

- Those adults with at least basic numeracy skills can expect to earn a quarter more than those who lack the necessary skills to solve basic mathematical problems.

- Between a third and a half of people with poor numeracy skills have a desire to improve them but less than 4% have actually attended any numeracy classes.
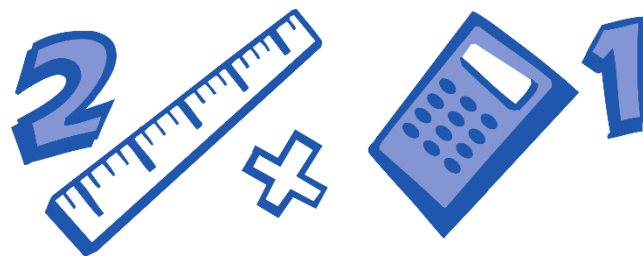
National Curriculum aims for children

- To become _fluent_ in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop _conceptual understanding_ and the ability to recall and apply knowledge rapidly and accurately

- _To reason_ mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

- can solve problems by _applying_ their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

At Cecil Road we aim for our children:

- To be an active participant in their own learning.
- To be confident and numerate.
- To be **_fluent_** in their mathematics at the appropriate level.
- To be able to **_reason_** about their learning using the correct mathematical vocabulary.
- To be able to _apply_ their skills and knowledge as they progress, through **_sustainable_** learning.
- _To develop an appreciation that mathematics is a key skill that equips them for life._
- To _enjoy_ mathematics

What does Maths learning look like at Cecil Road?

Our curriculum is based on the national curriculum and White Rose Maths and other materials that support the delivery of the curriculum.

These include: Power Maths, NCETM, NRich– these are used across KS1 and KS2 allowing children to be exposed to a variety of different types of learning and to ensure coverage of fluency, problem solving and reasoning in different formats to ensure that our maths curriculum is rich and varied.

What does Maths look like in Year 4?

Find the perimeter of regular and irregular polygons

Convert mixed numbers to improper fractions and vice versa

Begin to use expanded formal methods for addition and subtraction.

Solve addition and subtraction two-step problems deciding which operations and methods to use and why

Have a secure understanding of number: confidently identifying the value of each digit in a 4 digit number E.g. 2378 the 3 represents 300.

Recognise common groups of equivalent fractions and finding the corresponding decimal.

To confidently and securely know times tables facts, including the inverse up to 12x12

To solve practical and number problems using reasoning to justify answers.

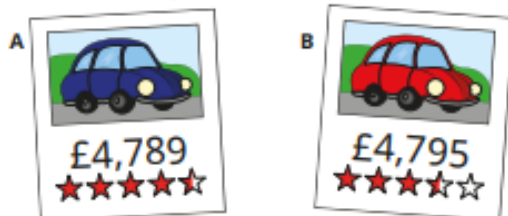Multiply two-digit and three-digit numbers by a one-digit number using formal written layout

6 Write the missing phrase.

| is less than | is greater than |

a) 4,720 _____ 4,635

b) 5,100 _____ 800

c) 3,195 _____ 3,591

d) 2,000 _____ 7,999

7 Which is the more expensive car?

A
£4,789
★★★★★

B
£4,795
★★★★☆

Describe the steps you used to compare the car prices.

8 Write <, > or = to compare the numbers.

a) 6,000 ◯ 3,981   d) 32 ◯ 2,000

b) 4,512 ◯ 4,521   e) £6,418 ◯ £6,419

c) 900 ◯ 1,200   f) 2,500 mm ◯ 2,060 mm

9 Teddy and Scott have some digit cards.

| 1 | 4 | 5 | 7 |

Teddy makes the number 4,571

Scott says his number is greater than Teddy's.

Teddy says Scott's number must start with a 5

Is Teddy correct? _____

Explain how you know.

_____

_____

10 What could the missing digits be?

a) 4,523 is greater than 4,5_7

b) 7,000 < _,513

c) 3,854 > 3,85_

d) 5,650 > 4,_ 7_

Compare answers with a partner.

11 Write all the possible missing digits.

a) 2,778 is less than 2,7_4

_____

b) 6,000 > _,259

_____

What does Maths look like in Year 3?

Consistently use the correct number formation (0-9).

To recognise the place value of each digit in a three-digit number (hundreds, tens and ones).

To read and write numbers up to 1,000

To add and subtract mentally and scaling these by 10 e.g. 6 + 3 = 9, 60 + 30 = 90.

To understand the inverse relationship between add and subtract

To choose strategies to help me answer questions such as partitioning, number lines, counting on, counting back, bar models and eventually formal methods such as the column method.

To identify angles greater than or less than a right angle

To recall my 2, 5, 10s, 3, 4 and 8 times tables and related division facts.

To solve number and practical problems, including reasoning using my number knowledge.

White Rose Maths

Name _____ Class _____

3 Use lines and dots to draw each number.

Complete the sentences.

a)

There are 4 tens and 3 ones.

The number is ☐

b)

There are ☐ tens

and ☐ ones.

The number is 50

4 Use base 10 to represent the number 47 in two different ways.
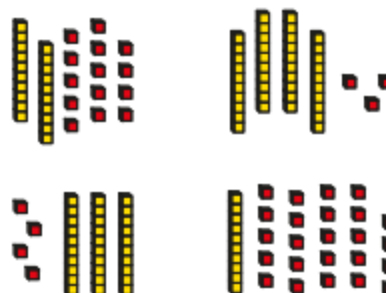
Draw your answer.

5 Tiny uses base 10 to make 34 in different ways.

Which picture does **not** represent 34?

Circle your answer.

Talk to a partner about the mistake Tiny has made.

6 Amir is thinking of a 2-digit number.

- There are 3 more tens than ones.
- There are an odd number of ones.

What number could Amir be thinking of?

Find as many numbers as you can.

How many different ways can you show each number?

MATH:
YOU SHOULD NOT only KNOW WHAT YOU ARE DOING. YOU SHOULD ALSO KNOW WHY & HOW

HARRY WONG

It is crucial that children can explain their thinking using the appropriate vocabulary. This not only embeds their own learning but supports the learning of others through hearing quality explanation.
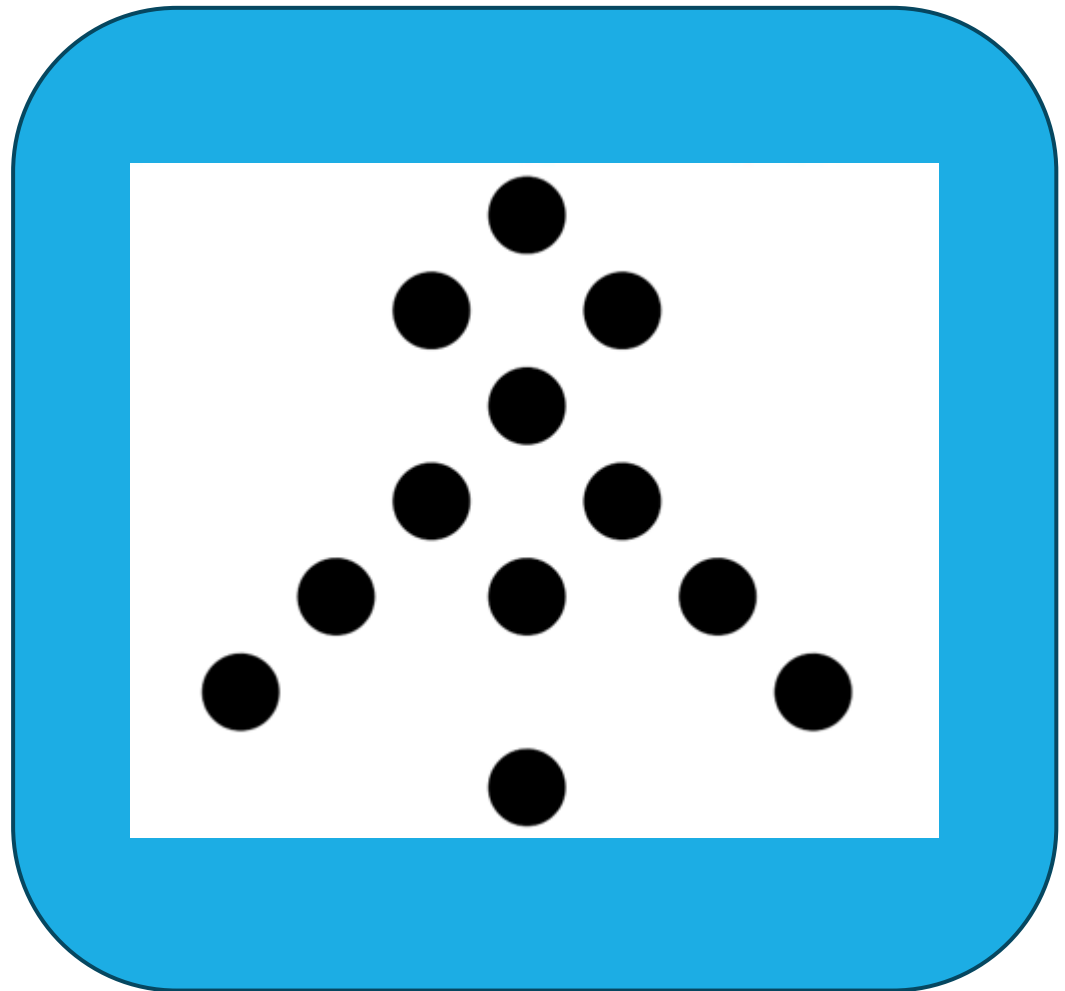
Questioning and Talk

'Teachers can provide regular opportunities for pupils to develop independent metacognition through pupils explaining to themselves, teachers and other pupils how they planned, monitored, and evaluated their completion of a task.'

Working with the person next to you can you write a number sentence to go with the dotted formation?
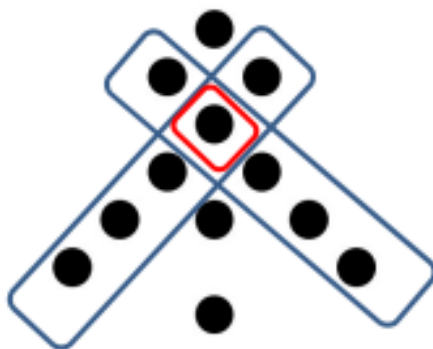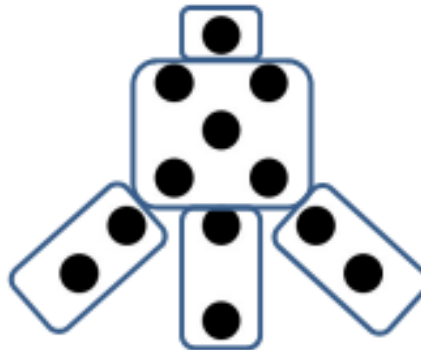
Number Talks

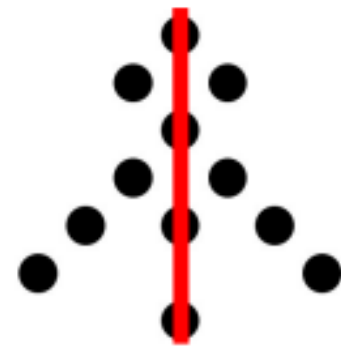## How many ways …?
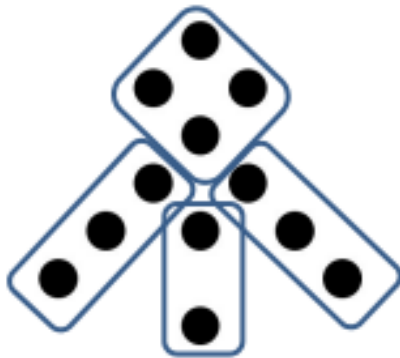
$4 + 3 + 3 + 2 = 12$
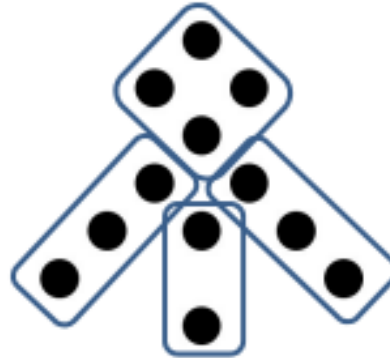
$4 + 3 + 2 + 3 = 12$
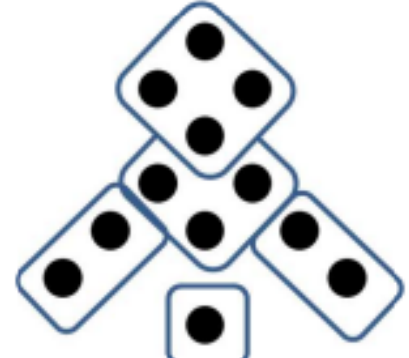
$4 + 3 + 2 + 2 + 1 = 12$

$5 + 5 + 3 - 1 = 12$

$1 + 5 + 2 + 2 + 2 = 12$

$6 + 6 = 12$

Calculate mentally:
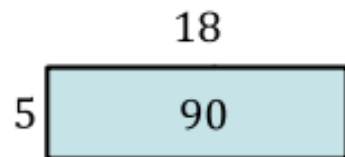
$$18 \times 5$$

How did you do it?

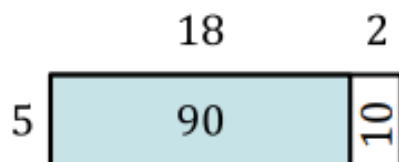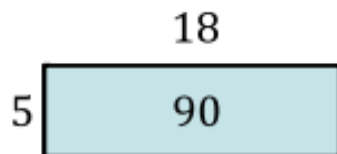18

5 | 90

$$10 \times 5 = 50$$
$$8 \times 5 = 40$$
$$50 + 40 = 90$$

9

10 | 45 / 45

18

10 | 90 / 180

$$18 \times 10 = 180$$
$$180 \div 2 = 90$$

18   2

5 | 90 | 10
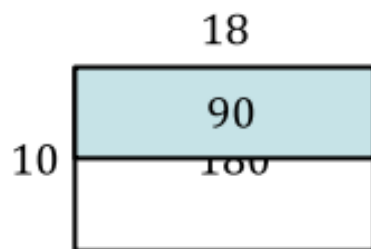
$$20 \times 5 = 100$$
$$2 \times 5 = 10$$
$$100 - 10 = 90$$

18

5 | 90

$$9 \times 10 = 90$$
$$45 \times 2 = 90$$

18

5 | 90

$$9 \times 5 = 45$$
$$45 \times 2 = 90$$
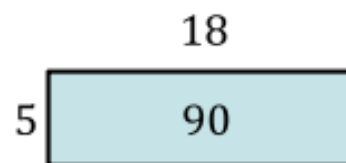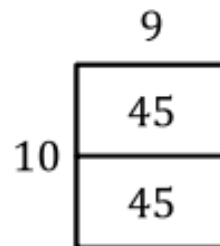
'By giving our students practice in *talking with others*, we give them frames for *thinking on their own*.'

Vygotsky, L. (1978)

Reasoning and Problem Solving

What is reasoning?
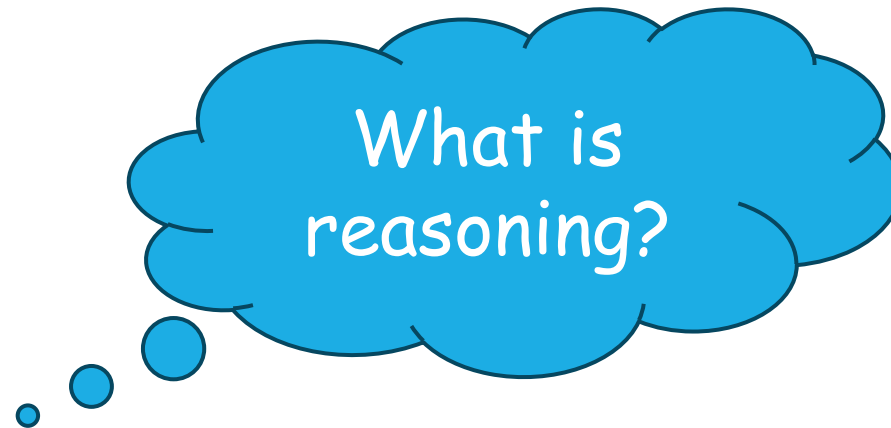
Reasoning is the action of thinking about something in a logical, sensible way.

Progression in Reasoning

Describing	Simply tells what they did
Explaining	Offers some reasons for what they did (may or may not be correct)
Convincing	Confident that their chain for reasoning is right (inductive reasoning)
Justifying	A correct logical argument that has a complete chain of reasoning
Proving	A watertight argument that is mathematically sound (deductive reasoning)

NRICH (2014)

Calculate 8×5

Tick (✓) which of the statements below are true.

$8 \times 5 = 8 + 8 + 8 + 8 + 8$ ☐

$8 \times 5 = 16 + 8 + 8 + 8$ ☐

$8 \times 5 = 16 + 16 + 8$ ☐

$8 \times 5 = 40$ ☐

Calculate 8 × 5

Tick (✓) which of the statements below are true.

$8 × 5 = 8 + 8 + 8 + 8 + 8$ ☐

$8 × 5 = 16 + 8 + 8 + 8$ ☐

$8 × 5 = 16 + 16 + 8$ ☐

$8 × 5 = 40$ ☐

If you know this, what else do you know?

Calculate 8×5

Tick (✓) which of the statements below are true.

$8 \times 5 = 8 + 8 + 8 + 8 + 8$ ☐

$8 \times 5 = 16 + 8 + 8 + 8$ ☐

$8 \times 5 = 16 + 16 + 8$ ☐

$8 \times 5 = 40$ ☐

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Calculate 8×5

Tick (✓) which of the statements below are true.

$8 \times 5 = 8 + 8 + 8 + 8 + 8$ ☐

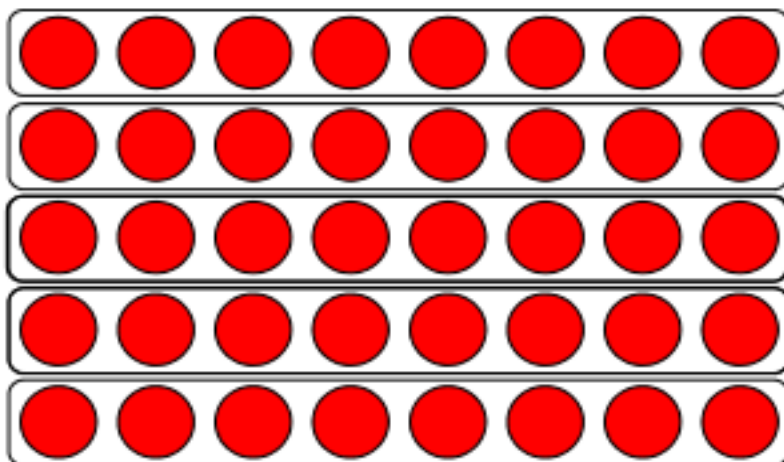$8 \times 5 = 16 + 8 + 8 + 8$ ☐
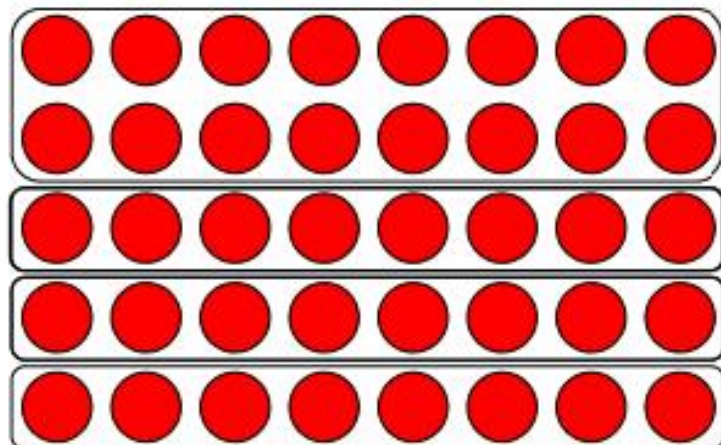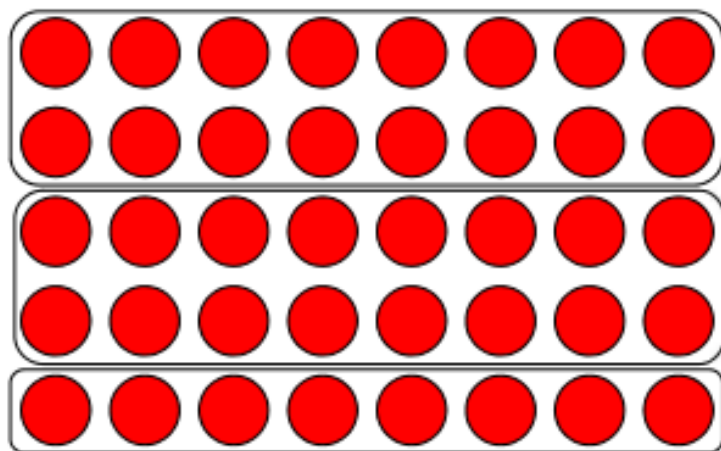
$8 \times 5 = 16 + 16 + 8$ ☐

$8 \times 5 = 40$ ☐

If you know this, what else do you know?

Calculate 8×5

Tick (✓) which of the statements below are true.

$8 \times 5 = 8 + 8 + 8 + 8 + 8$	☐
$8 \times 5 = 16 + 8 + 8 + 8$	☐
$8 \times 5 = 16 + 16 + 8$	☐
$8 \times 5 = 40$	☐

If you know this, what else do you know?

$$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 \qquad 20 + 20$$

$$10 + 10 + 10 + 10$$

$$5^2 + 5 \times 3 \qquad\qquad\qquad\qquad 4 \times 10$$
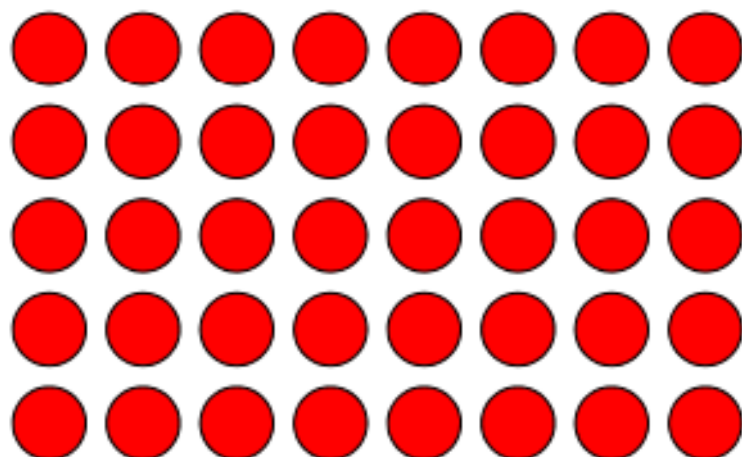
$$5^2\left(1 + \frac{3}{5}\right) \qquad\qquad\qquad\qquad 2 \times 20$$

$$4^2 + 4^2 + 8 \qquad\qquad\qquad 2\left(4^2 + 4\right)$$

$$4^2 + 4^2 + 2 \times 4$$

What is the same? What is different?

How do you know…   Why do you know…

Explain why…

$$17 + 10 > 17 + 8$$

Multiplication Grid

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Multiplication

MathsHUBS

	1	2	3	4	5	6	7	8	9	10	11	12
1	1											
2	2	4										
3	3	6	9									
4	4	8	12	16								
5	5	10	15	20	25							
6	6	12	18	24	30	36						
7	7	14	21	28	35	42	49					
8	8	16	24	32	40	48	56	64				
9	9	18	27	36	45	54	63	72	81			
10	10	20	30	40	50	60	70	80	90	100		
11	11	22	33	44	55	66	77	88	99	110	121	
12	12	24	36	48	60	72	84	96	108	120	132	144

78 facts   the coloured ones are 42 of them...   36 left,
nines trick.... 30 left...
elevens...   24 left...
square numbers... 17 left...

60

Another way to support your children is by using:

When it comes to times tables, speed AND accuracy are important — the more facts your child remembers, the easier it is for them to do harder calculations. Times Table Rock Stars is a fun and challenging programme designed to help students master the times tables. World Famous musicians need to practice and so do children with their tables!
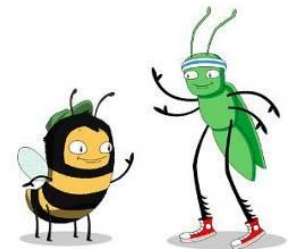
Another way to support your children is by using:

For your child to be fully motivated and for them to get the best out of the practice, they need your help - your praise, reminders and support will help your child feel confident and motivated.

Logging in to Times Table Rockstars

1 Type **play.ttrockstars.com** into your browser's address bar.

2 Click Login! > School > Student

3 Enter the School Name.

Login ✕

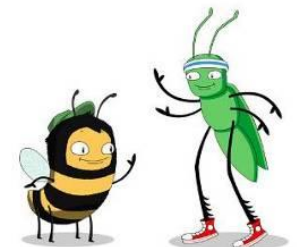School, family or organisation *

🏠

4 Enter your child's username and password.
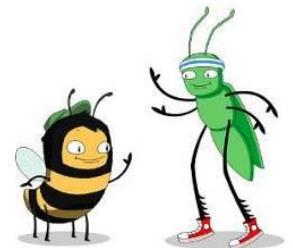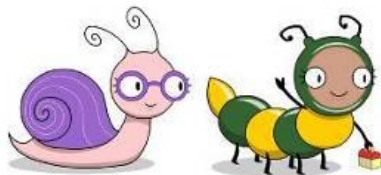
Username *

🔒 Password *   👁

Login

Single Player

Garage – the questions will only come from the times tables the teacher has set for the week. As pupils start to answer questions, TT Rock Stars works out which facts they take longer on and will give them more of these questions to answer. The Garage is best for getting quicker at a few facts. Players get 10 coins per question.

Studio - the questions in the Studio can be anything from 2x2 up to 12x12.

TT Rock Stars calculates each the mean speed from their last 10 games in the Studio and translates into a Rock Status:
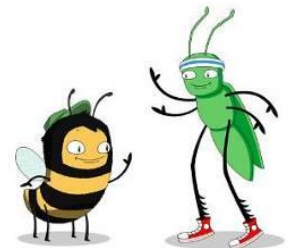
Under 1 second per question to become a Rock God

Under 2 seconds per question to become a Rock Legend

Under 3 seconds per question to become a Rock Star

Over 3 seconds is a Busker

They earn 1 coin per question and the Studio is the place for them to set their best time across all the tables.

Multiplayer

Rock Arena - The Arena allows players to compete against all other members of their Band (their Bandmates would need to join the same game in order to compete together). A new Arena game starts every 15 seconds and once the clock starts they race to answer more questions than the others. In the Arena, questions will only come from the times tables the teacher has set for the week, similar to the Garage. They earn 1 coin per correct answer.
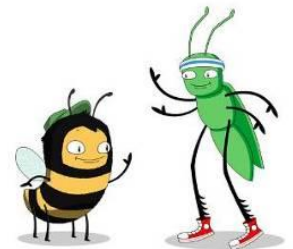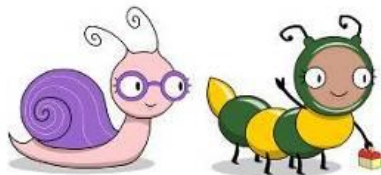
How can I help my child at home?

- *Create a positive view of mathematics – be a mathematician together*

- *learn times tables together*

- *tell the time*

- Help your child to understand the importance of mathematics in everyday life

- Support your child when learning basic skills such as number bonds, counting in equal steps and tables

- Help them to see the value of learning these skills

- Value homework activities even if you think your child knows it. They must be fluent and able to apply the skills if learning is to be sustainable

Thank you for listening.
We hope the workshop helps you understand how you can support your child at home.